

Environmental Requirements for Chemicals in Products – a guide for purchasers



Prioritising and identifying hazardous substances in commodities

By applying the right requirements when making purchases you can prevent negative effects on human health and the environment from chemical substances in products. There are many ways to apply chemicals-related product requirements when making purchases. The following is a five-step model for how you can prioritise which products and substances to focus your requirements on.

This guide is the result of the Future Trade dialogue, and the model has been developed in a unique collaboration between government agencies and businesses. It is based on the participating companies' own experiences of applying chemicals-related product requirements and on the criteria included in PRIO, a risk reduction tool developed by the Swedish Chemicals Inspectorate (Kemikalieinspektionen, Kemi).

The guide is aimed mainly at preventative, long-term efforts to prevent certain hazardous substances being included in products. It is intended mainly for users who are involved in various ways with developing product-related chemicals requirements for commodity purchases, and it is our hope that it will facilitate your formulation of those requirements. When purchasing chemical products, other aspects may be important and may need to be included in the assessment of the product. Bear in mind also that products may be subject to legal restrictions related to their chemical substance content. For further information, consult the Restricted Substances Database on Kemi's website, www.kemi.se.

KemI has participated as one of several contributors, and the brochure is a joint product of all the participants in the Future Trade partnership. The ambition has been to provide information which is as concrete as possible, so that it will be immediately usable by the participating companies. In many cases, this has required simplifications of complex relationships and interactions.

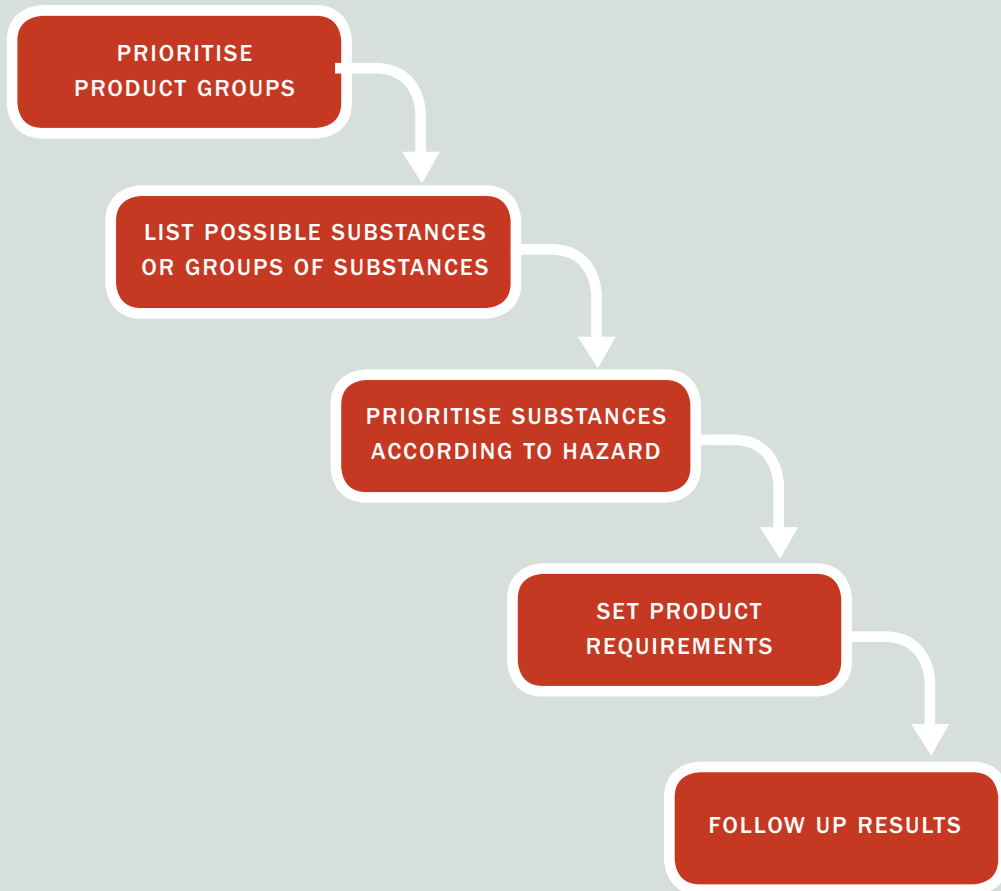
Participating agency and companies in the project “Hazardous substances in commodities”: KemI, Skånemejerier, Arla Foods, Coop and ICA. The production of this brochure has been financed by KemI and the Future Trade Secretariat.

Future Trade is a completely new form of collaboration between companies, municipalities, regions and the government, with the purpose of achieving a sustainable development of the convenience goods trade. The goal is to reduce effects on the environment at every stage. The participants have jointly set up goals to work towards, and have agreed to apply a number of concrete measures.

Future Trade includes participants from several parts of the convenience goods supply chain: producers, traders and transporters. A number of agencies are participating on behalf of the government in the efforts to carry out the government’s commitments within Future Trade, whose secretariat is run by the Swedish Environmental Protection Agency.

Read more on www.framtidahandel.se

SETTING CHEMICALS-RELATED PRODUCT REQUIREMENTS FOR PURCHASES



1. Prioritise product groups



In order to prioritise which product group or groups you should primarily be setting requirements for, it is important to establish to what extent humans or the environment are subjected to the chemical substances contained in the product. The first step in dealing with chemicals-related product requirements is therefore to identify which product group or groups are used in such a way that, or have characteristics such that an exposure of the substances in the product could occur.

By answering the questions² below, you will get an idea of the extent to which humans or the environment are exposed to the chemical substances in the product. Exposure, along with the substances' properties, are key to what risk the product might pose and therefore important when determining if the product should be prioritised for continued preventative work. Also bear in mind that each individual factor, such as volume, use, release of chemical substances from the product etc., may in and of itself give rise to a large exposure.

How large is the volume³ of the product group?

The total volume of the product group is a factor which affects the spread of the substance. The volume need not be calculated exactly – in most cases, a rough estimate should be enough. The simplest way is usually to estimate the volume of a certain product group; another way is to calculate to what extent a certain substance or material occurs, and then set priorities based on that.

Is the user group particularly sensitive?

Some user groups are more sensitive to chemical substances than others. These might be children, pregnant women, allergy sufferers, or user groups sensitive in other ways.

How does the use of the product affect exposure?

Think about whether the product is used in such a way that it affects the extent to which humans or the environment come into contact with chemical substances it contains. Products used in close contact with the skin, e.g. sheets, clothes, jewellery, shoes, or products used by children in various ways, result in a degree of exposure which should be considered. The product's lifespan may also be significant when judging exposure.

Are chemical substances released from the product?

Chemical substances may be released from a product when it is used, and this affects the extent to which humans or the environment are exposed. The release of chemical substances is tied to a number of factors such as water solubility, vapour pressure, how stable the substance is when exposed to water or air, and how the substance is bonded to the material. By way of example, chromium in stainless steel is strongly bonded to the material while additives such as plasticisers in certain plastics are more easily released.

Since the risk of substance release may depend on which materials the product is made of, it may be advisable to go back to this step after step 3 in order to update the assessment if necessary.

How is the product disposed of?

The way in which the product is disposed of may be very significant to the possible exposure of humans or the environment. Uncontrolled incineration can lead to emissions into the air, and products in landfills may leak hazardous substances into the surroundings over a long period of time. Recycling and dismantling may lead to humans being exposed through their work environment. In order to make a good assessment of how humans and the environment are affected by a product, it is therefore also important to know what happens when the product is disposed of.

Draw up a table

Compile the answers to the above questions in a table, to get an overview of how the products vary in their effects on humans and the environment. Begin with one product or product group and then move on to step 2. Alternatively, you can go through the answers for a number of products before deciding which ones to continue with. Your choice of method may depend on how far you have got in other environmental work, and the experience the organisation has in the area. To begin by going through the exposure for a number of products may be worthwhile as it provides a greater opportunity to focus efforts on those products which pose the greatest risks. Many choose to prioritise products on volume alone, but it is then important to be aware that this criterion doesn't always reflect the product group that poses the greatest risk.

Remember to document the basis for your decisions

It is important in all steps to document your methods and what your decision was based on. When you have completed step 1, you should have a list of prioritised product groups to continue working with. At the end of each step in the model is an example showing how a fictitious company, “Swimjoy Ltd”, has dealt with chemicals requirements for air mattresses. As a further illustration of the method, there is an example at the end showing how Arla Foods could use the method. The Arla Foods Group is Europe’s second largest dairy company.

Table of exposure The table shows how “Swimjoy Ltd” has used the questions above in their work with air mattresses. The fact that the product is used by children and that it comes into direct skin contact, plus the fact that there is a risk of emission, are all things to consider when setting priorities.

Criteria Products	<i>Volume</i>	<i>Sensitivity of the user group</i>	<i>How use affects exposure¹⁾</i>	<i>Risk of emission</i>	<i>Lifespan</i>	<i>Risks at the disposal stage</i>
<i>Air mattresses</i>	15,000	Used by children to a great extent	Used in direct contact with skin	The product is often used in direct sunlight, i.e. at high temperatures, which affects the extent to which substances such as plasticisers are released from the plastic	The product is assumed to have a relatively short lifespan	Incineration or landfill likely. Some exposure, but limited in relation to the usage phase.

1) If the product is used in contact with skin; by children; indoors; outdoors; in contact with water; etc.

2¹ List possible substances or groups of substances that could be contained in the product



Good chemicals-related product requirements are adapted to the product group in question. The more precise you can be in your requirements to the suppliers, the greater the likelihood of getting a good response. It may be helpful to begin with the product's materials composition, and then find out which substances are common in the various materials.

Charting the most common materials in the products purchased is one method. There is a large number of different materials, but the following groups of materials should be enough to make an initial assessment of the product's contents. To get more information about what the product might contain, contact your supplier. This information can then form the basis of the product requirements outlined in step 4.

Plastics and rubber may contain lead compounds, chromates, tin compounds, chlorinated paraffins, phthalates and possibly scenting agents, among other things.

Textiles may contain formaldehyde, fungicides, flame retardants, colouring agents and waterproofing agents, e.g. PFOS, among other things.

Leather may contain tanning agents such as chromium, among other things.

Metals are chemical elements, e.g. lead, iron, copper, mercury, aluminium, nickel, silver, tin and zinc. There are also alloys (mixtures of several elements).

Glass may contain lead, arsenic and antimony, among other things.

Wood may contain protective agents which in turn contain chromium, arsenic, copper, creosote, etc.

Paper may contain colouring agents etc.

Additives

Think about the intended function of chemical substances in the product. This might be to colour the product or material, to give it a scent, to preserve it, to soften it, to protect it against fire, water or mould. What chemical substances does it contain to fulfil these functions?

Further information

To get further information about your products, begin by asking your supplier. You can also turn to various trade associations and research institutes for further information about different materials and what substances they may contain. There are many different types of plastics and metals. Find out as much as you can about what plastic or metal the product contains. Examples of chemical substances which may occur in chlorinated paraffins, phthalates, etc. may be sought by substance group using KemI's PRIO tool. The criteria for environmental labelling and the criteria of the EKU tool can also be useful. Further information on these is available on www.svanen.nu or www.eku.nu.

Remember to document the basis for your decisions

Step 2 results in an overall list of possible substances connected to the prioritised product groups.

Continuing with the example of “Swimjoy Ltd”, air mattresses are made of almost 100% plastic, so we should focus on the following:

- * Type of plastic
- * Stabilisers – may be tin
- * Colouring agents – may be chromates, lead, etc.
- * Plasticisers – may be phthalates
- * Scenting agents – may be musk substances

3. Prioritise substances to be comprised in the product requirement



It is usually not necessary to set requirements for all included substances in a product. A good basis for setting priorities is therefore how hazardous the substance is. Find out if the substances in the product have any hazardous properties. Should these substances be substituted, or is it enough to reduce the risks in other ways?

The difference between substances of very high concern and other substances hazardous to human health and the environment

There is a large number of substances with properties that are hazardous to human health and the environment in various ways. This only poses a risk when humans and the environment are subjected (exposed) to the substances. For most hazardous substances, risks may be reduced to an acceptable level by handling the substances in a suitable way. For substances of very high concern, the risks are such that substances should be completely excluded even if humans and the environment are exposed to them only to a minor extent. If such substances are present in the product they should consequently be given the highest priority when product requirements are formulated.

Use PRIO

By searching Kemi's risk reduction tool, PRIO, you can get help in finding out if the substance has any properties hazardous to human health or the environment, and if it is a phase-out substance or a priority risk reduction substance. You can also search phase-out substances and risk reduction substances, and get more information about the criteria below. See www.kemi.se/prio

Phase-out substances should not be included in the product. For risk reduction substances, the requirements may be affected by the product's exposure. You should therefore go back to your table for exposure in step 1 before you choose which substances to set requirements for. You can also search the Restricted Substances Database on Kemi's website for information about substances subject to legal restrictions.

Criteria for substances of very high concern, so-called phase-out substances

- * Carcinogenic, Mutagenic, toxic to Reproduction (CMR)
- * (Persistent, Bioaccumulating, Toxic/very Persistent, very Bioaccumulating PBT/vPvB)
- * Particularly hazardous metals (mercury, cadmium, lead and their alloys)
- * Endocrine disrupter or strongly allergenic
- * Ozone-depleting

Criteria for priority risk reduction substances

- * Very high acute toxicity
- * Mutagenic (category 3)
- * Allergenic
- * High chronic toxicity
- * Environmentally hazardous, long-term effects
- * Potential Persistent, Bioaccumulating, Toxic (very Persistent, very Bioaccumulating PBT/vPvB)

Remember to document the basis for your decisions

Step 3 should result in a list of prioritised substances or of substances' inherent properties relevant to each product group.

At "Swimjoy Ltd" they decided to look at possible plasticisers, phthalates, as a first step. Plasticisers which might be included in the product are DEHP, DBP, BBP, and DINP, DIDP and DNOP. By searching the Restricted Substances Database on Keml's website, they found out that there are regulations restricting the use of these plasticisers in the 76/769/EEC limitations directive.

Since DEHP, DBP and BBP are classified as toxic to reproduction category 2, they are also encompassed by the phase-out criteria in PRIO. The plasticisers DINP, DIDP and DNOP are not covered by PRIO's criteria. But since the product is used by children it is decided that the product requirements to the supplier should include all plasticisers with similar characteristics to those mentioned in the directive. In other words, requirements are set more stringently than in the directive.

4. Make product requirements



The substance or substances selected for phasing out or risk reduction should be followed up with the supplier/producer by setting product requirements. The requirements should be as specific as possible; it's a good idea to include the substance's CAS number. Think about what validation you would like as proof that the requirement has been fulfilled, and state this as well. Inform the supplier of the product requirements.

To learn more and to avoid problems in the future, it is also a good idea to ask which substances have been used as substitutes and what characteristics these substances[?] have.



Remember to document the basis for your decisions

Step 4 should result in a list with product requirements for the supplier.

Examples of product requirements

Since plastic is a commonly occurring material, “Swimjoy Ltd” decided to expand the requirement to cover all plasticised plastic products much used by children, i.e. including products not primarily intended for children but often used by them. Below are some examples of how requirements can be formulated.

- * “Swimjoy Ltd” does not accept hazardous plasticisers, phthalates, in products which may be used by children.
- * “Swimjoy Ltd” does not accept the following phthalates: DEHP, CAS no.; DBP, CAS no.; BBP, CAS no.; and DINP, CAS no.; DIDP, CAS no.; DNOP, CAS no.; or substances with similar properties, in products which may be used by children, regardless of whether they can put them in their mouth or not.
- * “Swimjoy Ltd” does not accept substances which are toxic to reproduction (categories 1, 2 or 3) in products which may be used by children, regardless of whether they can put them in their mouth or not.

At “Swimjoy Ltd” they will now go back to step 3 in order to see what further characteristics and substances it may be necessary to add to the requirements.

5. Follow up results



When following up the supplier's responses, it is advisable to make a reasonableness check. For example, you can look at whether the information is sufficiently detailed, and if there is information that corroborates content limits etc. If necessary, the question must be asked again and be further specified. If the response is judged sufficient, then:

- * Check that the requirements are fulfilled. If not, think about possible measures. Perhaps the requirements need to be further specified, or the product substituted.
- * Check that any new substances are acceptable. To this end, you can use Keml's PRIO risk reduction tool, the substance register, or the classification database.
- * Document the information and secure requirements for future purchases.
- * Feed back to your supplier. Feedback is an important part of increasing the possibilities for better and safer products for human health and the environment.

An example from Arla Foods

Arla Foods might apply the methods in this guide in the following way.

1. Select one or more products.

Arla might select food packaging for milk, cheese, fresh produce and butter. The product is used by a large group of adults and children on a daily basis. It comes into close contact with dairy products, and is recycled for material and energy content.

2. Make a list of substances or groups of substances the product might contain.

The product consists mainly of paper or plastic. A good first step would therefore be to look at substances which might occur in these materials.

- * Printing ink (e.g. ITX)
- * Phthalates (plasticisers in plastic)
- * FTOH (breaks down into PFCAs)
- * Monomers (styrene, vinyl chloride)
- * BADGE
- * Bisphenol A

3. Identify and prioritise possible hazardous substances in the product's various materials.

In the case of milk cartons, Arla might choose to follow the criteria in Keml's PRIO tool (see p12).

4. Formulate product requirements and present them to the supplier/producer.

Arla Foods does not accept:

- * Phthalates DEHP CAS no. 117-81-7, DBP, BBP
- * Hazardous printing ink that fulfils phase-out criteria in PRIO (CMR, PBT/vPvB, particularly hazardous metals, endocrine disrupters and ozone-depleting substances)
- * Printing ink which migrates to the product, e.g.
ITX (isopropyl thioxanthone) CAS no. 5495-84-1;
EHDAB (2-ethylhexyl-4-dimethylaminobenzoate) CAS no. 21245-02-3
- * FTOH (fluorotelomer alcohol)

5. Assess the response

Arla might do a reasonableness check and a quality assessment of the answers. Although most suppliers have phased out ITX or EHDAB substances in some packaging materials, it is still deemed relevant to keep the requirement. Arla would need to investigate FTOH content further.

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Du kan förebygga att människa eller miljö påverkas negativt av kemiska ämnen i produkter genom att ställa rätt krav vid inköp av varorna. Det finns många sätt att arbeta med kemikalierelaterade produktkrav vid inköp. I den här broschyren presenteras en modell i fem steg som kan hjälpa dig med hur du ska prioritera vilka produkter och ämnen du främst ska ställa krav på.

Modellen riktar sig till dem som arbetar med kemikalierelaterade produktkrav vid inköp inom dagligvaruhandeln men kan även användas av andra som arbetar med inköp av produkter.

Broschyren är framtagen inom ramen för dialogprojektet Framtida handel. Det är en helt ny typ av samverkan mellan företag, kommuner, regioner och regeringen med syfte att åstadkomma en hållbar utveckling av handeln med dagligvaror. För att nå de mål som satts upp inom Framtida handel krävs att de olika aktörerna i många fall samverkar, därför startas projekt med olika inriktningar. Modellen i den här broschyren är ett resultat från ett av projekten, där personer från Kemikalieinspektionen (projektledare), Skånemejerier, Arla Foods, Coop och ICA har medverkat.



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